

ABSTRACT OF THE DISCLOSURE

A low or no pollution power generation system is provided. The system has an air separator to collect oxygen. A gas generator is provided with inputs for the oxygen and a hydrocarbon fuel. The fuel and oxygen are combusted within the gas generator, forming water and carbon dioxide. Water or other diluents are also delivered into the gas generator to control temperature of the combustion products. The combustion products are then expanded through at least one turbine or other expander to deliver output power. The combustion products are then passed through a separator where the steam is condensed. A portion of the water is discharged and the remainder is routed back to the gas generator as diluent. The carbon dioxide can be conditioned for sequestration. The system can be optimized by adding multiple expanders, reheaters and water diluent preheaters, and by preheating air for an ion transfer membrane oxygen separation.